

ABSTRACT

Solid-state lithium batteries (SSLBs) may have the potential to safe and long-distance driving in electric-vehicles (EV) (Long, Xiaoming, Zhiming, & Li-Zhen, 2021). However, manufacturing processes and new materials need to be developed to make these batteries commercially available.

INTRODUCTION

The EV market demands low-cost, environmentally friendly, high power density, long cycle life, and fast recharging batteries. SSLBs are emerging as a promising choice due to high safety standards, low cost, and high capacity; however, there are still some challenges related to advanced materials and manufacturing processes that need to be solved (Xinyou, Yan, Guofeng, & Chris, 2020).

Solid-State Lithium Batteries SSLBs vs. Traditional Lithium-ion Batteries LiBs

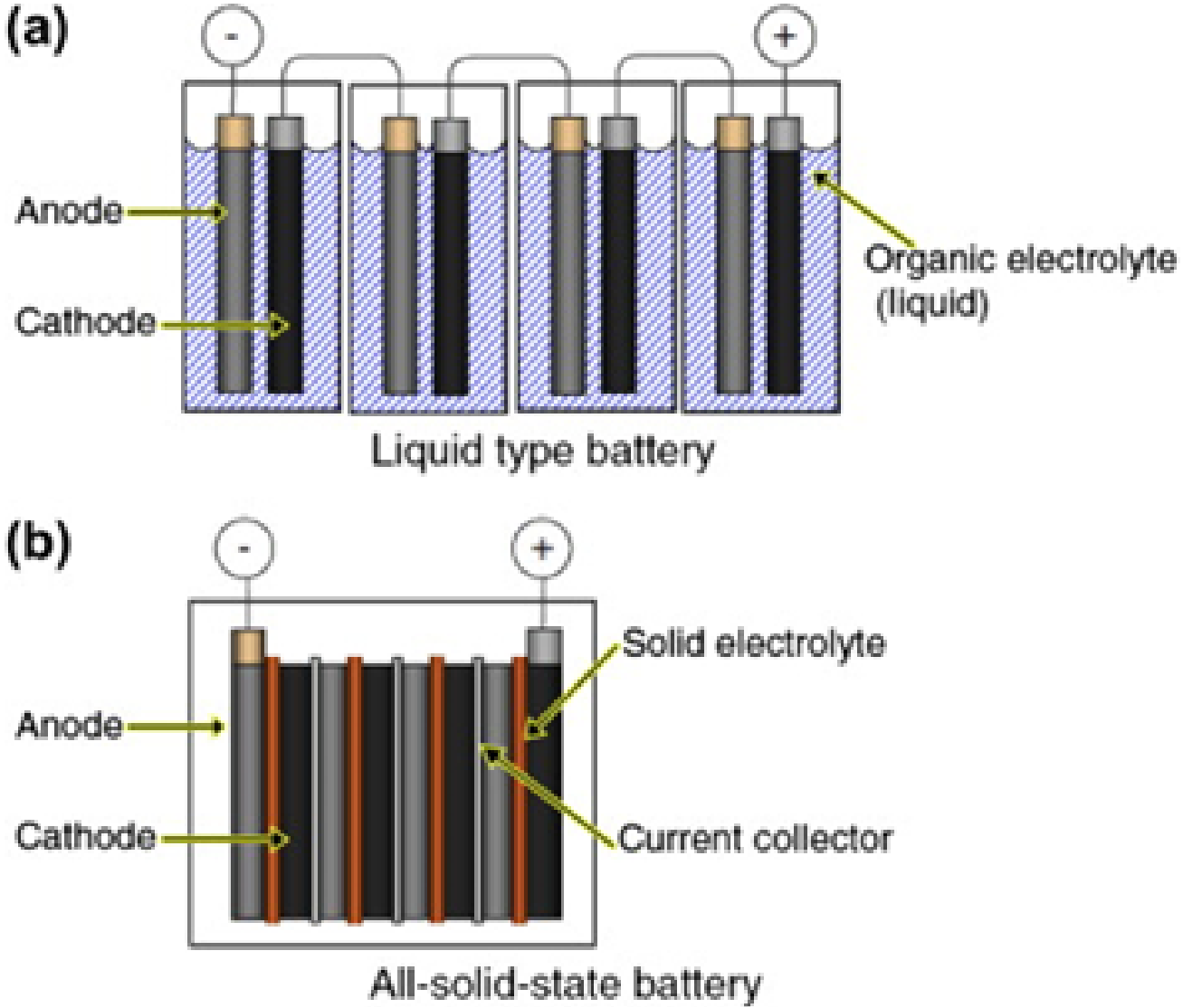


Figure 1. (a) Conventional lithium-ion battery and (b) Solid-state lithium-ion battery (Fuminori, Chihiro, & Hideki, 2014)

Table 1. Benefits of SSLBs and drawbacks of LiBs (Hang Chao, Xin, Wen, & Xiaoming, 2019)

SSLBs	LiBs
<div><div></div><div><ul style="list-style-type: none">- Powerful batteries without extra space- Long cycle life- Charge faster</div></div>	<div><div></div><div><ul style="list-style-type: none">- Cause accidents- Require weighty cooling systems- Suffer electrode corrosion</div></div>

Solid-State Lithium Battery Challenges

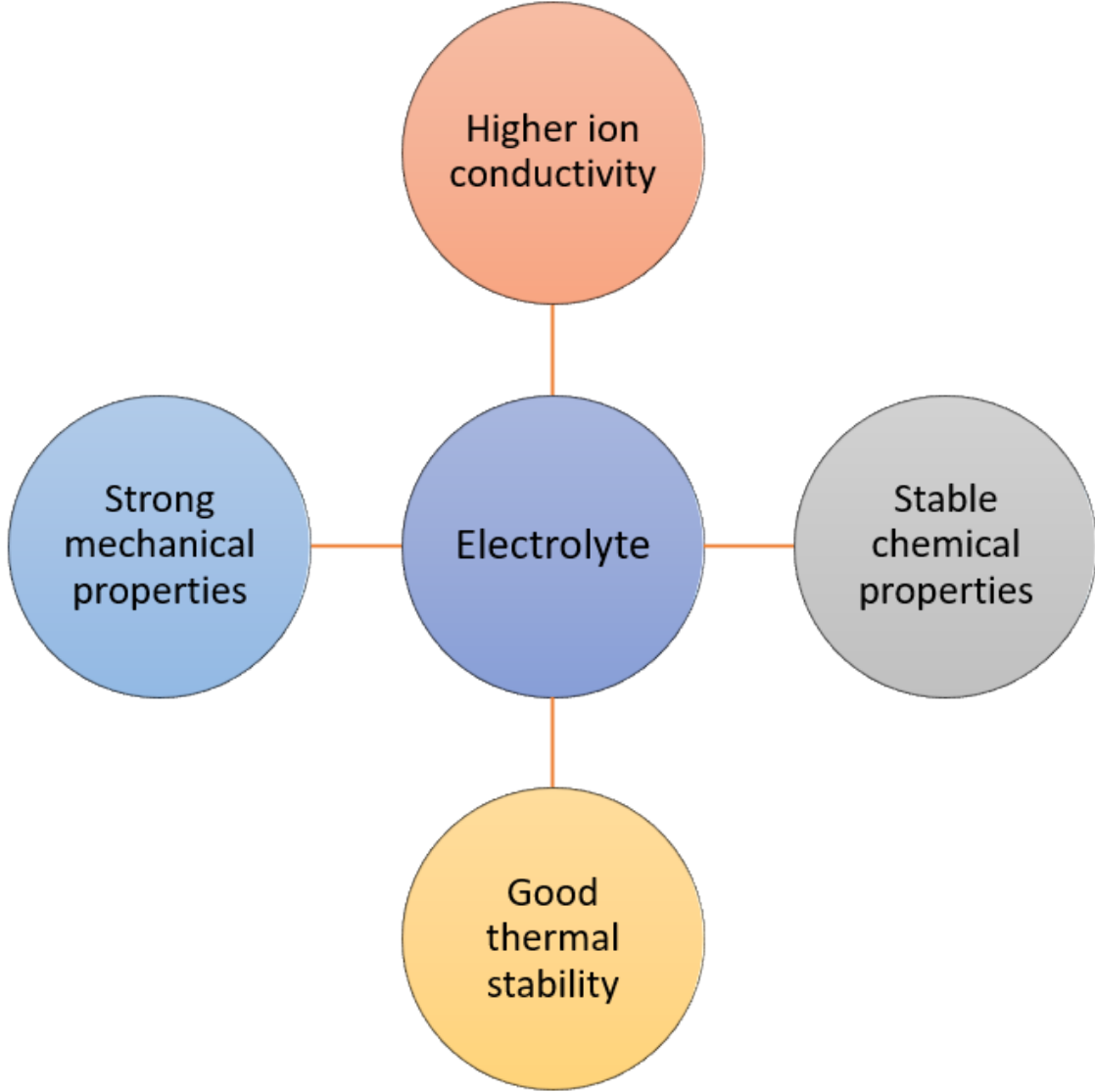


Figure 2. Ideal electrolyte properties (Rui, Yue, Weixiang, & Fengchun, 2020)

CONCLUSIONS

- SSLBs could become the power source for EV thanks to their enhanced safety standards, increased energy storage capacity, and improved long cycle life.
- New electrolytes and manufacturing processes must be improved to meet SSLBs expectations.

REFERENCES

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